

World revision of the genus *Nealsomyia* Mesnil (Diptera, Tachinidae)

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World revision of the genus *Nealsomyia* Mesnil (Diptera, Exoristinae, Tachinidae). - A world taxonomic revision of the genus *Nealsomyia* is presented and the identity of the genus is defined and discussed. *Nealsomyia lindneri* Mesnil, *N. rufella* (Bezzi), *N. rufipes* (Villeneuve) and *N. triseriella* (Villeneuve) are redescribed and illustrated; *Nealsomyia merzi* sp. n. from Namibia is described, illustrated and compared with similar species. A key to the five known species of *Nealsomyia* is presented.

Keywords: Tachinidae - *Nealsomyia* - world revision - taxonomy - new species - identification key.

INTRODUCTION

Nealsomyia is a small genus of Goniini (sensu Herting, 1960, 1984; Wood, 1987), a vast and varied tribe, characterized by a particular reproductive strategy. Adult females lay a large number of "microtype" eggs on the food plants of their hosts; these eggs hatch only after being ingested. They are not damaged while passing through the host's mouth parts, and hatch in the mesenteron under the stimulus of proteolytic enzymes (Wood, 1987). The young larvae then reach the haemocoel by breaking through the wall of the intestine. Once fully developed, the mature larva kills its host and pupates within the host's remains or in the ground. It was this complex suite of morphological and behavioural features that led Herting (1960, 1984), Wood (1987) and later many other specialists to consider the Goniini as a monophyletic group.

The genus *Nealsomyia* was described by Mesnil in 1939 to include *Exorista* (*Alsomyia*) *triseriella* Villeneuve, 1929, known at that time from a single male; this species remained the only one assigned to the genus until Mesnil wrote the first revision of the genus in 1954, also including *Exorista quadrimaculata* Baranov, 1934 and *Alsomyia rufipes* Villeneuve, 1937. Later, Mesnil (1959) described a further African species (*Nealsomyia lindneri*), considered by Crosskey (1980) as a taxon of uncertain generic placement. Mesnil (1954: 356) first included *Nealsomyia* in the tribe Salmaciini (= Goniini + Eryciini + Ethillini + Winthemiini of Herting, 1984) subtribe Masicerina (cf. Mesnil, 1944: 20, 22), and then in the tribe Eryciini (= Eryciini + Ethillini + Winthemiini of Herting, 1984) subtribe Nileina (Mesnil, 1975: 1386). Later,

Crosskey (1976: 250) considered it as an Eryciine (= Goniini + Eryciini [partim] of Herting, 1984). Finally, Herting (1984), following his above mentioned "concept", included it in the tribe Goniini.

Four species of the genus *Nealsomyia* were known before this study: *N. rufella*, an Oriental species with a distribution reaching the Palaearctic Region; *N. rufipes*, known from a few localities in Pakistan, India and Sri Lanka; *N. triseriella*, known only from a few specimens from two localities in Egypt; and *N. lindneri*, known from a single male from Tanzania. Herein, a new species of *Nealsomyia* from Namibia is described.

Hosts of this genus are known only for *N. rufella* and for the similar species *N. rufipes*. Both parasites of pests belonging to the families Psychidae and Limacodidae (Lepidoptera).

METHODS

The dissection of male and female terminalia was carried out following the method described in detail by O'Hara (2002) for the male terminalia. The dissected male terminalia are preserved in glycerine inside a small plastic tube, which is pinned together with the specimen. The female terminalia and the rest of the abdomen are preserved, separately from the rest of the specimen, in a test tube containing glycerine and alcohol. Drawings were done using a Leica DMLS optic microscope (terminalia) and a Leica MZ 7.5 stereoscopic microscope (head, legs, wings and abdomen).

The following information is given for each species: synonyms when existing, the countries of origin of the material examined (listed in alphabetical order), the known hosts and distribution. Label data are cited as printed, using the following symbols:

- / end of a line and beginning of the next line;
- // end of a label and beginning of the next label (from top to bottom on the same pin);
- [...] explanations, such as the number and sex of the examined specimens, or phrases written in an unintelligible fashion or perpendicularly to the rest.

TERMINOLOGY

External morphology (except for antenna): Merz & Haenni (2000). Antenna: Stuckenberg (1999). Male terminalia: Sinclair (2000). Female terminalia: Kotrba (2000). Measurements and ratios of head: Tschorsnig & Richter (1998).

ACRONYMS

- BLKU Biosystematics Laboratory, Kyushu University, Fukuoka, Japan (H. Shima).
- BMNH The Natural History Museum, London, UK (N. Wyatt).
- CNC Canadian National Collection of Insects, Ottawa, Canada (J. E. O'Hara).
- MHNG Muséum d'histoire naturelle, Genève, Switzerland (B. Merz).
- MSNM Museo di Storia Naturale, Milano, Italy (F. Rigato).
- SMNS Staatliches Museum für Naturkunde, Stuttgart, Germany (H.-P. Tschorsnig).
- TAU Department of Zoology, Tel Aviv University, Tel Aviv, Israel (A. Freidberg).

TAXONOMIC TREATMENT

Nealsomyia Mesnil, 1939

Nealsomyia Mesnil, 1939: 31, note 1 [original description]; Mesnil, 1954: 356 [redescription]; Crosskey, 1976: 145, 148 [taxonomy], 250 [catalogue]; Crosskey, 1981: 692 [catalogue]; Herting, 1984: 64 [catalogue]; Chao, 1996: 1888 [keys]; Herting & Dely-Drascovits, 1993: 227 [catalogue]; Tschorsnig & Richter, 1998: 810 [keys].

Type species: Exorista (Alsomyia) triseriella Villeneuve, 1929 (by original designation).

Recognition. Colour. General setulae of head (except for occiput), thorax, legs and abdomen black. Eye with pale yellow hairs; occiput with white setulae only. Thorax black in ground colour, with grey microtrichosity; scutum, before suture, with four longitudinal dark vittae.

Head (Figs 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 5.1, 5.2). Eye densely haired (each hair longer than combined diameter of 3-5 facets). Postpedicel 1.5-2.2 times as long as antennal pedicel. Arista with short hairs that are shorter than its maximum diameter. Arista thickened on basal 2/5-1/2. First and second aristomeres short, not longer than wide. Antenna longer than the height of the gena and shorter than facial ridge. Lateral vertical setae: male – hair-like, generally not differentiated from the postocular setae; female – well-developed (*N. rufella* and *N. rufipes*). Ocellar setae proclinate, well-developed. Frons with only scattered black setulae outside frontal row. Frons at its narrowest point 0.5-0.9 times as wide as an eye in dorsal view. Six to 10 frontal setae descending to the level of the base of the postpedicel or to the base of the arista. Usually one pair of strong upper reclinate orbital setae – if two, (some specimens of *N. rufella*) then the posterior one short and weak. Proclinate orbital setae: absent in the male; two in the female. Parafacial entirely bare below lowest frontal seta. Facial ridge straight in lateral view or slightly concave, with short decumbent setae at most on lower 2/5. Vibrissa arising at level of lower facial margin. Face and lower facial margin not visible in lateral view. Genal dilation below eye well-developed. Occiput flat, without black setulae behind the postocular row.

Thorax. Scutum before suture with four narrow, longitudinal dark stripes. Prosternum generally with some setulae along its lateral margins, rarely bare (one specimen of *N. triseriella*). Proepisternum bare. Postpronotum with 4 setae, the 3 basal setae arranged in a (more or less) straight line, the anterior one placed between middle basal and medial basal (the medial basal seta is very short in *N. lindneri*). Scutum with 2-3+3 acrostichal setae, 2-3+3-4 dorsocentral, 1+3 intraalar, 2 posthumeral, 1 presutural, 2 notopleural, 3 supraalar setae; postalar callus with 3 setae. First postsutural supraalar seta longer than notopleural setae. Katepisternum with 2-3 setae. Katepimeron with 0-3 setulae on anterior fourth. Anepimeron with setulae on posterior half. Anatergite bare. Anterior and posterior lappets of posterior spiracle unequal in size. Scutellum: apical marginal setae crossed and horizontal (not inclined upwards) (Figs 1.3, 2.3, 5.3).

Wing (Figs 1.5, 3.5, 5.4). Membrane hyaline, upper and lower calypter white. Costal seta well differentiated from the other costal setae. Base of R_{4+5} with few setulae, sometimes with only one setula. Cell r_{4+5} open (see *N. lindneri*, redescription), closed just at wing margin or with a short petiole. Lower calypter: medial margin more or less contiguous to lateral margin of the scutellum.

Legs (Figs 2.4, 3.4). Preapical anterodorsal seta of fore tibia shorter than preapical dorsal one. Mid-tibia with one strong anterodorsal seta, if two (*N. triseriella*, *N. merzi*), then the upper one very short and weak, less than 1/3 of the strong one.

Abdomen (Figs 1.4, 2.5, 3.3). Middorsal depression on abdominal syntergite 1+2 extending posterior to hind margin of that segment. Tergites 3 and 4 of male each ventrally with one pair of patches of appressed setulae [possibly autapomorphy of the genus, see *Remarks*].

Male terminalia (Figs 1.6, 1.7, 1.8, 2.6, 2.7, 2.8, 2.9, 2.10, 3.6, 3.7, 3.8, 3.9, 3.10, 4.1, 4.2, 4.3, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6). Sternite 5 with hind margin deeply cleft; lateral lobe large; medioapical margin of lateral lobe with dense microscopic setulae; transversal membranous stripe present. Tergite 6 (Fig. 3.9) divided into two hemitergites, joining segment 7+8 by membrane; spiracle 6 situated on membrane. Sternite 6 well developed and asymmetrical, articulated to segment 7+8 on its left side, and attached to it by a membrane on its right side. Sternite 6 bare; segment 7+8 with few, weak setae. Epandrium short and convex. Cerci divided apically, slightly bent posteriorly, in lateral view. Bacilliform sclerites long. Medial plate of hypandrium subrectangular in dorsal view; hypandrial arms joining postero-medially, forming a bridge-like structure. Aedeagus: basiphallus with basal extension; epiphallus not differentiated; distiphallus joining basiphallus by a dorsal sclerite and by a ventro-lateral membrane; distiphallus largely membranous lateroventral surface of distiphallus covered with scale-like spinules.

Bionomy (*N. rufella*). Female micro-oviparous, laying eggs on leaves of host-plants (Shima & Tachi, 1996).

Known hosts. Larvae of Psychidae and Limacodidae (Lepidoptera).

Remarks. The presence of a pair of large patches of appressed setulae on the ventral side of abdominal tergites 3 and 4 in males of the Goniini is known so far only from *Nealsomyia* and *Pseudalsomyia* Mesnil, 1968. However very similar patches of more or less fine setulae on the ventral or latero-ventral sides of abdominal tergites are known in some other genera of Exoristinae (cf. Crosskey, 1973, 1976, 1984; Wood, 1987, Tschorsnig & Richter, 1998). These patches are usually present on abdominal tergites 4 and/or 5 with the exception of the Eryciine genus *Anacamptomyia* Bischof, 1904 and some *Lydella* Robineau-Desvoidy, 1830, which have a pair of patches on the ventral side of tergites 3 and 4 (cf. Crosskey, 1980: 274) very similar to those of *Nealsomyia* (Cerretti, unpublished). Analogous structures are found at the sides of tergite 5 in the males of genus *Sarromyia* Pokorny, 1893 (Tachinidae), even if superficial analyses show very different morphological characters to those of the Exoristinae. All other features listed above in the "Recognition" paragraph are shared with other genera among the Goniini or Tachinidae in general, but only in *Nealsomyia* they occur all together in the described combination, univocally identifying the genus. For these reasons *Nealsomyia* could be considered a monophyletic genus.

Distribution. *Nealsomyia* includes five species distributed from the tropical and subtropical (including desert and savana) areas of the Afrotropical and South-West Palearctic Regions, to the tropical and humid subtropical of the South-East Palearctic Region and most of the Oriental Region (Map 1).



MAP 1. Known distribution of *Nealsomyia* spp.

KEY TO THE SPECIES OF *NEALSOMYIA* MESNIL

- 1 Four postsutural dorsocentral setae. Mid-tibia with only one antero-dorsal seta (Fig. 3.4); vein M present beyond bend (Figs 3.5, 5.4); abdominal tergites 3 and 4 without median discal setae (Fig. 3.3) 2
- Three postsutural dorsocentral setae. Other combination of characters 3
- 2 Legs black or dark brown, sometimes coxae and throcanter reddish. Posterior 1/3 of the scutellum red or, rarely, completely black; sides of abdominal tergites 3, and anterior half of 4, more or less reddish *N. rufella* (Bezzi)
- Legs yellow or red. Posterior half of the scutellum yellowish or red, sometimes scutellum completely yellowish; sides of abdominal tergites 3 and 4 usually largely yellow or red, sometimes abdomen almost

- entirely yellow except for a dark median longitudinal vitta on tergites 3, 4 and 5. *N. rufipes* (Villeneuve)
- 3 Abdominal tergites 3 and 4 without median discal setae (Fig. 1.4). Mid-tibia with only one anterodorsal seta (Fig. 2.4). M vein not reaching wing margin, ending about where bend should be (Fig. 1.5). Head profile as in Fig. 1.1. Abdomen and scutellum entirely black in ground colour (Fig. 1.3) *N. lindneri* Mesnil
- Abdominal tergites 3 and 4 with a pair of median discal setae (Fig. 2.5). Mid-tibia with 2 anterodorsal setae, the uppermost anterodorsal seta very short and weak, less than 1/3 as long as the middle anterodorsal one (Fig. 2.4). M vein reaching wing margin (Fig. 5.4). Head profile as in Figs 2.1, 5.1. Scutellum at least apically yellowish or red and sides of abdominal tergites 3 and 4 red or yellowish 4
- 4 Male frons at its narrowest point 0.5 times as wide as an eye in dorsal view (Fig. 2.2). Medial vertical setae crossed (Fig. 2.2). Scutellum without lateral marginal setae (Fig. 2.3). Abdominal tergites 3-5 entirely microtrichose *N. merzi* sp.n.
- Male frons at its narrowest point 0.80-0.85 times as wide as an eye in dorsal view (Fig. 5.2). Medial vertical setae sub-parallel (not crossed) (Fig. 5.2). Scutellum with a pair of lateral marginal setae (Fig. 5.3). Abdominal tergites 3-5 with at least posterior margin lacking microtrichosity *N. triseriella* (Villeneuve)

Nealsomyia lindneri Mesnil, 1959

Pl. 1

Nealsomyia lindneri Mesnil, 1959: 12 [original description] (type locality – Tanzania, Mara, Mugango); Crosskey, 1980: 881 [catalogue, uncertain generic placement]; Crosskey, 1984: 286, 297 [keys].

Material examined. TANZANIA [Holotype ♂]: Mugango / a. Victoria See / 19.- 25.III. 1952 / D.O. Afrika Exp. [blue paper] // Mugango / 19.III.52 [handwritten] // *Nealsomyia lindneri* Mesn. / L. Mesnil det. 1958 // TYPE [red paper] // HOLOTYPE / of *Nealsomyia lindneri* Mesn. / examined 1983 / R.W. Crosskey. [SMNS].

Redescription. MALE. *Length.* (Holotype): 5.39 mm.

Colour. Head black - except frontal vitta and gena - with light grey microtrichosity; frontal vitta dark brown; gena reddish. Antenna black. Palpus yellow. Thorax black in ground colour, with grey microtrichosity; scutum, before suture, with four longitudinal dark vittae; scutellum and abdomen entirely black in ground colour. Tergite 3 dorsally covered with microtrichosity on anterior 4/5, tergites 4 and 5 microtrichose on anterior 2/3. Tegula black, basicosta reddish-brown, veins yellow. Base and stem of the halter yellowish, knob more or less brown. Legs black. Fore femur microtrichose on its posterior surface.

Head (Figs 1.1, 1.2). Arista thickened on its basal 1/2 or slightly more (left arista of holotype very short, abnormally developed, see Fig. 1.2). Second aristomere slightly longer than wide. Postpedicel 1.5 times as long as pedicel. Eye densely covered with long hairs that are longer than the combined diameters of four facets. Frons at its narrowest point 0.9 times as wide as an eye in dorsal view. Medial vertical setae

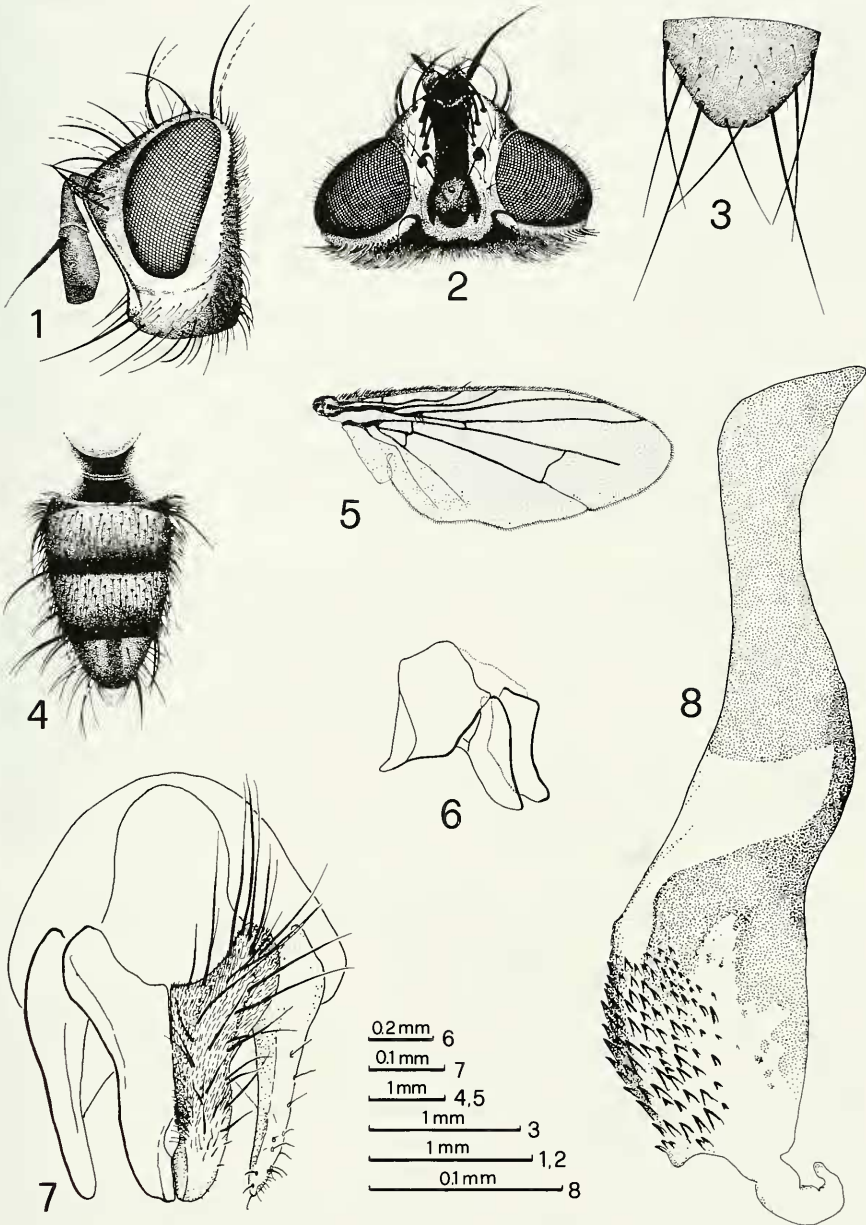


PLATE 1

Figs 1-8. *Nealsomyia lindneri*: Tanzania, Mugango (male - holotype) - 1. Head in lateral view. 2. Head in dorsal view. 3. Scutellum in dorsal view. 4. Abdomen in dorsal view. 5. Right wing. 6. Epandrial complex in right lateral view. 7. Epandrial complex in posterior view. 8. Aedeagus in left lateral view.

strong, retroclinate and sub-parallel, about $3/4$ as long as vertical eye diameter. Right lateral vertical seta (asymmetric) absent or not differentiated from the postocular setae; left lateral vertical seta about 1.5 times as long as the postocular setae. One reclinate orbital seta about $3/4$ as long as medial vertical seta. Six frontal setae descending to the level of the base of the postpedicel. Fronto-orbital plate with one row of sparse black setulae, lateral to the row of frontal setae. Parafacial (in lateral view) at its narrowest point 0.4 times as wide as the width of postpedicel. Gena in profile about $1/3$ of vertical height of eye (height measured in the same vertical plane as height of head). Postocular setae short, bent forwards. Prementum about 3 times as long as wide. Palpus cylindrical with some setulae both ventrally and apically.

Thorax. Prosternum with few setulae (1-3) on its lateral margin. Scutum with 2+3 acrostichal setae, 2-3+3 dorsocentral, 1+3 intraalar, 2 posthumeral, 1 presutural, 2 notopleural, 3 supraalar setae; postalar callus with 3 setae. Proepimeron with 2-3 setae and 4-5 long and robust setulae. Katepisternum with 3 setae. One short anepimeral seta on left side, absent on the other side (asymmetrical). Anepisternum with 5-6 setae. Katepimeron bare. Scutellum (Fig. 1.3) with 1 pair of hair-like discal setae, 1 pair of crossed, horizontal apical setae, 1 sub-apical, 1 lateral and 1 basal setae; the lateral setae are slightly longer than the apical ones.

Legs. **Fore leg** – Tibia with 5 anterodorsal setae, 1 posterodorsal, 2 posterior setae; anterodorsal preapical seta shorter than dorsal. Claws longer than tarsomere 5. **Mid leg** (left lacking) – Femur with rows of very irregular, in number, length and thickness, anteroventral and posteroventral setae; 3 anterior setae and 2 posterior setae. Tibia (as in Fig. 3.4) with 1 anterodorsal seta; 1 weak posterodorsal, 2 posterior, 1 ventral setae. Claws about as long as tarsomere 5 or slightly shorter. **Hind leg** – Tibia with an irregular row of anterodorsal and posterodorsal setae, each row with a seta almost at midlength about 1.3-1.5 as long as the others; 2 anteroventral setae, 2 dorsal preapical setae. Posteroventral preapical seta shorter than anteroventral preapical one. Claws about 0.90 times as long as tarsomere 5.

Wing (Fig. 1.5). Costal spine longer than crossvein R-M. Second costal portion (between subcostal break and R_1) bare ventrally. Base of R_{4+5} with 3-5 setulae. M vein not reaching wing margin, ending approximately where bend should be.

Abdomen (Fig. 1.4). Syntergite 1+2 with 1 pair of short median marginal setae, 1 pair of lateral marginal setae at least twice as long as the median marginals; general setulae short (longer on the sides of the syntergite). Tergite 3 with 1 pair of median marginal setae (lacking in the holotype); 1 or 2 pairs of lateral marginal setae. Tergite 4 with a row of 11 marginal setae. General setulae of tergites 3 and 4 decumbent. Tergite 5 with rows of marginal and discal setae.

Terminalia. Cerci (Figs 1.6, 1.7) broad, with a dorso-medial suture, apically separated from each other and slightly bent medially. Cerci in profile broader than in the other known species of *Nealsomyia*. Surstylus (Figs 1.6, 1.7) broad, well developed, sub-triangular in lateral view, with several setulae latero-apically. Pregonite rounded apically and bent anteriorly, with a row of short and stout setae on its dorsal margin. Postgonite slender, rounded apically and bare.

FEMALE. Unknown.

Hosts. Unknown.

Distribution (Map 1). Afrotropical: Tanzania (Mara).

Remarks. The general shape of the head, the peculiar wing venation and the short, decumbent abdominal setulae give this species a characteristic general appearance which separates it from its co-generics. These characteristics, together with the asymmetric teratology of the arista and the anepimeral seta, induced Crosskey (1980) to list this species with the generically unassigned taxa, at least until the acquisition of new material. However, the examination of the male terminalia (which had not been extracted so far) and of the chetotaxy, do not provide strong enough arguments against considering *N. lindneri* as “*appartenant clairement au genre Nealsomyia*”, to quote Mesnil (1959: 12).

The peculiarity of vein M which ends in the position usually occupied by the bend of M, was interpreted by Crosskey (1984: 297) as a probable teratology. This feature is however present in many other species of tachinids, sometimes within a single species, like the goniine *Ocytata pallipes* (Fallén, 1820) (cf. Tschorsnig & Herting, 1994; Cerretti, unpublished), for which specimens both with a complete or incomplete vein, like in the case of *N. lindneri* (Fig. 1.5), can be found.

Nealsomyia merzi sp. n.

Pl. 2

Material examined. Holotype ♂: Namibia / Mont Erongo / 24.I.2000 / leg. J. Sudre [MHNG]. The holotype has been labelled as follows, handwritten with black ink on red card: HOLOTYPUS ♂ / *Nealsomyia / merzi* / Cerretti 2002.

Etymology. I dedicate this species to my colleague Bernhard Merz, Diptera curator at the Museum of Geneva.

Diagnosis. Frons at its narrowest point 0.5 times as wide as an eye in dorsal view. Medial vertical setae strong, reclinate and crossed. Scutellum without lateral marginal setae. Abdominal tergites 3-5 dorsally covered with dense grey microtrichosity.

Description. MALE. Length. 5.46 mm.

Colour. Head black - except frontal vitta and gena - with light grey microtrichosity; frontal vitta reddish-brown; gena reddish. Scape black; pedicel black, apically and distally dark-brown; postpedicel and arista black. Palpi basally brown, shading into yellowish distally. Thorax black, with grey microtrichosity; scutum, before transverse suture, with four longitudinal dark vittae; posterior 1/3 of the scutellum reddish. Abdomen black, sides of tergites 2 and 3 reddish; abdominal tergites 3-5 dorsally covered with dense grey microtrichosity. Tegula and basicosta black, costa basally yellowish, shading into brown distally; remaining veins brown. Halter yellowish. Legs black.

Head (Figs 2.1, 2.2). Arista thickened on its basal 2/5. Second aristemere not longer than wide. Postpedicel 1.5 times as long as pedicel. Eye densely covered with long hairs that are longer than combined diameter of 4-5 facets. Frons at its narrowest point 0.5 times as wide as an eye in dorsal view. Medial vertical setae strong, reclinate and crossed, about 3/4 as long as vertical eye diameter. Lateral vertical seta hair-like, about 0.5 times as long as medial vertical. One reclinate orbital seta about as long as medial vertical. Nine to 10 frontal setae descending to the level of the base of the post-

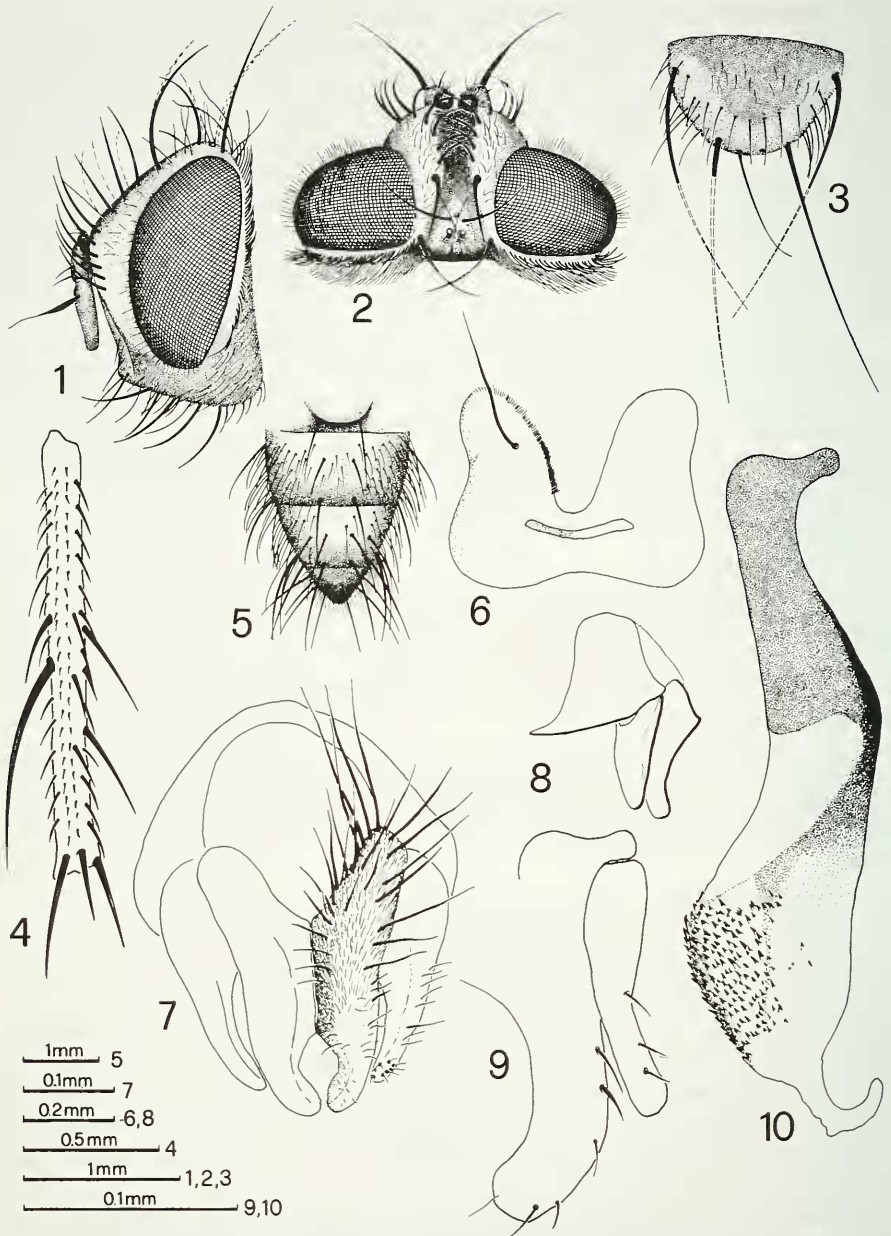


PLATE 2

Figs 1-10. *Nealsomyia merzi* sp. n.: Namibia, Mont Erongo (male - holotype) - 1. Head in lateral view. 2. Head in dorsal view. 3. Scutellum in dorsal view. 4. Left mid tibia. 5. Abdomen in dorsal view. 6. Sternite 5 in ventral view. 7. Epandrial complex in posterior view. 8. Epandrial complex in left lateral view. 9. Pregonite and postgonite in left lateral view. 10. Aedeagus in left lateral view.

pedicel. Fronto-orbital plate with one or two rows of sparse black setulae lateral to the row of frontal setae. Parafacial (in lateral view) at its narrowest point 0.9 times as wide as the width of postpedicel. Gena in profile 1/5 of vertical eye height. Postocular setae long, bent forwards. Prementum about 4 times as long as wide. Palpus slightly clavate with some setulae ventrally and apically.

Thorax. Prosternum with some setulae on its lateral margin (3-4). Scutum with 3+3 acrostichal setae, 3+3 dorsocentral, 1+3 intraalar, 2 posthumeral, 1 presutural, 2 notopleural, 3 supraalar; postalar callus with 3 setae. Proepimeron with 3 strong setae and 8-10 long setulae. Katepisternum with 3 setae. One anepimeral seta. Anepisternum with 6-7 setae. Katepimeron with few (2-3) setulae on anterior 1/5. Scutellum (Fig. 2.3) with 1 pair of discal setae, 1 pair of crossed apical setae (horizontal or inclined at most 30° to horizontal), 1 subapical, 1 basal – no lateral setae.

Legs. **Fore leg** – Tibia with an irregular row of short anterodorsal and posterodorsal setae, and 2 posterior setae; preapical anterodorsal seta shorter than preapical dorsal. Claws longer than tarsomere 5. **Mid leg** – Femur with rows of very irregular, in number, length and thickness, anteroventral and posteroventral setae, 2 anterior setae and no posterior setae. Tibia (Fig. 2.4) with 2 anterodorsal setae, the upper anterodorsal seta very short and weak, less than 1/3 of the length of the middle anterodorsal one. 1 weak posterodorsal seta, 2 posterior, 1 ventral. Claws about as long as tarsomere 5. **Hind leg** – Tibia with an irregular row of anterodorsal and posterodorsal setae, each row with a seta, almost at midlength, about 1.5 as long as the others; 2 anteroventral setae, 2 dorsal preapical setae. Posteroventral preapical seta shorter than anteroventral preapical one. Claws about 0.90 times as long as tarsomere 5.

Wing. Costal spine about as long as crossvein R-M or slightly longer. Second costal portion bare ventrally. Base of R₄₊₅ with 3-4 setulae. Bend of M nearly at a right angle or slightly obtuse. Wing cell r₄₊₅ with a short petiole, about as long as the diameter of M vein.

Abdomen (Fig. 2.5). Syntergite 1+2 with 1 pair of long median marginal setae, 2 pairs of lateral marginal setae; general setulae long and robust (longer on the sides of the syntergite). Tergite 3 with 1 pair of median marginal setae about as long as the dorsal length of tergite 3; 1 pair of median discal setae about 0.60 times as long as median marginal pair and sub-equal to the median marginals of the syntergite 1+2; 1 or 2 pairs of lateral marginal setae. Tergite 4 with a row of 9 marginal setae, 2 pairs of median discal setae and some long and robust setulae medially. Tergite 5 with rows of marginal and discal setae.

Terminalia. Cerci (Figs 2.7, 2.8) broad, with a dorso-medial suture, apically separated from each other and slightly bent medially. Surstylus (Figs 2.7, 2.8) well developed, sub-triangular in lateral view, with several setulae latero-apically. Pregonite (Fig. 2.9) rounded apically and bent anteriorly, with a row of short and stout setulae on its dorsal margin. Postgonite (Fig. 2.9) slender, apically rounded and bare.

FEMALE. Unknown.

Hosts. Unknown.

Distribution (Map 1). Afrotropical: Namibia.

Remarks. Species morphologically similar to *N. triseriella*, from which it is immediately distinguished because of the noticeably narrower vertex, the crossed outer

vertical setae, the absence of the lateral marginal setae of the scutellum and abdominal tergites 3-5 entirely covered with microtrichosity.

N. merzi and *N. triseriella* share the following characteristics : a) mid tibia with one short additional anterodorsal seta, dorsally to the strong anterodorsal one; b) abdominal tergites 3 and 4 with one pair of median discal setae. These features clearly separate these two taxa from the other *Nealsomyia*.

Nealsomyia rufella (Bezzi, 1925)

Pl. 3; Pl. 4, Figs 4, 5

Parexorista corvinoides var. *rufella* Bezzi, 1925: 119 [original description] [type locality – Malaysia, Kuala Lumpur]; Crosskey, 1967: 104 [lectotype designation].

Exorista quadrimaculata Baranov, 1934: 43 [original description] (type locality – Malaysia: Malaya, Selangor, Klang); Mesnil, 1954: 356 [redescription]; Crosskey, 1967: 102 [new synonymy]; Crosskey, 1967: 104 [lectotype designation]; Sabrosky & Crosskey, 1969: 44 [taxonomy].

Alsomyia indica Villeneuve, 1937: 407 [original description] [type locality – Vietnam [North], Tonkin, Cho gành] [syntypes ♂ ♀, not located]; Mesnil, 1954: 356 [as (new?) synonym of *N. quadrimaculata*].

Nealsomyia rufella (Bezzi, 1925): Crosskey, 1967: 102 [new assignment (as new combination), new rank (as new status)], 104 [lectotype designation]; Crosskey, 1976: 250 [catalogue], 288 [host catalogue]; Crosskey, 1981: 692 [catalogue]; Arnaud, 1982: 13 [taxonomy]; Holloway *et al.*, 1989: 21 [bionomy]; Harris, 1989: 189, 192 [taxonomy, biology, distribution]; Chao, 1996: 1919 [taxonomy]; Shima & Tachi, 1996 [faunistics and bionomics]; Shima, 1999: 50 [host catalogue].

Material examined. CHINA. [1 ♀]: China / Canton / W.E.Hoffman / 49-1082/ (1) [vertical] // COM INST. ENT. / COLL. No 11555 // Pres. by / Imp. Inst. Ent. / B. M. 1952-299. // *Alsomyia indica* Vill. / L. Mesnil det., 1947 [BMNH]. [1 ♂]: China / Canton / W.E.Hoffman // 49-1082 / (1) [vertical] // COM INST. ENT. / COLL. No 11555 // Pres. by / Imp. Inst. Ent. / B. M. 1952-299. // *Alsomyia indica* Vill. / L. Mesnil det., 1951 [BMNH].

INDONESIA. [1 ♂]: Paralectotype // Pematang Siantar / Sumatra, E. C. / 13. 1. 32 / Coll. R. I. Nel. // ex larva of / bagworm / No. 59 // Simpang Raja Fst. 2,200 feet // *Exorista / 4-maculata* / n.sp. / N. Baranoff [BMNH]. [3 ♀♀]: PEMATANG SIANTAR. / Sumatra E.C. / 21.II.31 / Coll. R.I. NEL. // Simpang Raja Est / 2,200 feet // ex larva of / bagworm / No 59 // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. // *Exorista / 4-maculata* / Baranoff. [BMNH]. [2 ♂♂]: PEMATANG SIANTAR. / 22.3.32 / Coll. R.I. NEL. // *Exorista / 4-maculata* / Bar // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. // Simbolon Estate / 1, 750 feet [BMNH].

IRAN. [2 ♂♂]: Teheran / Rafсандجان, 22.6.74 / M. Safavi leg. / ex *Amicta 4-angulata* [SMNS].

JAPAN. [5 ♂♂, 5 ♀♀]: KYUSHU / Fukuoka / Baikouen Mall / 15.IX.1995 / T. Tachi leg. [BLKU].

LAOS. [1 ♂]: Laos / 3-75 / G. Dean / C.I.E.A. 7961 // ex Psychid / on *Cassia* // *Nealsomyia* sp. / det. K. M. Harris, 1975 // Pres by / Com Inst Ent / B.M. 1975-1 [BMNH]. [1 ♀] [teratological]: Laos / 2-75 / G. Dean / C.I.E.A. 7961 // ex Psychid / on *Cassia* // *Nealsomyia* sp. / det. K. M. Harris, 1975 [BMNH].

MALAYSIA. [Lectotype ♀]: Lectotype // FED. MALAY STATES. / Kuala Lumpur. / V.1922 / Parasite from 119a / G.H. Corbett. / 119b [vertical] // Parasite on 119.A. (*Chalcoscelis fumifera*, Swinh). // Pres. by / Imp. Bur. Ent. / Brit. Mus. / 1925-540. // *Exorista / corvinoides* v.d.W. / var / *rufella* n.v. [BMNH]. [Lectotype ♂]: Lectotype // Malaya / Klang / 9.2.1931 / Entom. Div. / Agric. Dept. / 7451. [left, vertical] / Psychid on / *Areca* (7416) [right, vertical] // *Exorista / 4-maculata* / n.sp. / N. Baranoff. // Pres. by / Imp. Bur. Ent. / Brit. Mus. / 1933-43 [BMNH]. [1 ♂]: FED. MALAY STATES Kuala Lumpur -V.1922 Parasite from 119^a G. H. Corbett / Parasite on 119^a *Chalcoscelis fumifera* Swinh.) [MSNM]. [1 ♀]: Paralectotype // Malaya / Klang / 9.2.1931 / Entom. Div. / Agric. Dept. / 7451. [left, vertical] / Psychid on / *Areca* (7416) [right, vertical] // *Exorista / 4-maculata* / n.sp. / N. Baranoff. // Pres. by / Imp. Bur. Ent. / Brit. Mus. / 1933-43 [BMNH]. [1 ♂]: Malaya Peninsula / 8. 4. 32. / Kuala Lumpur / 8451 [left,

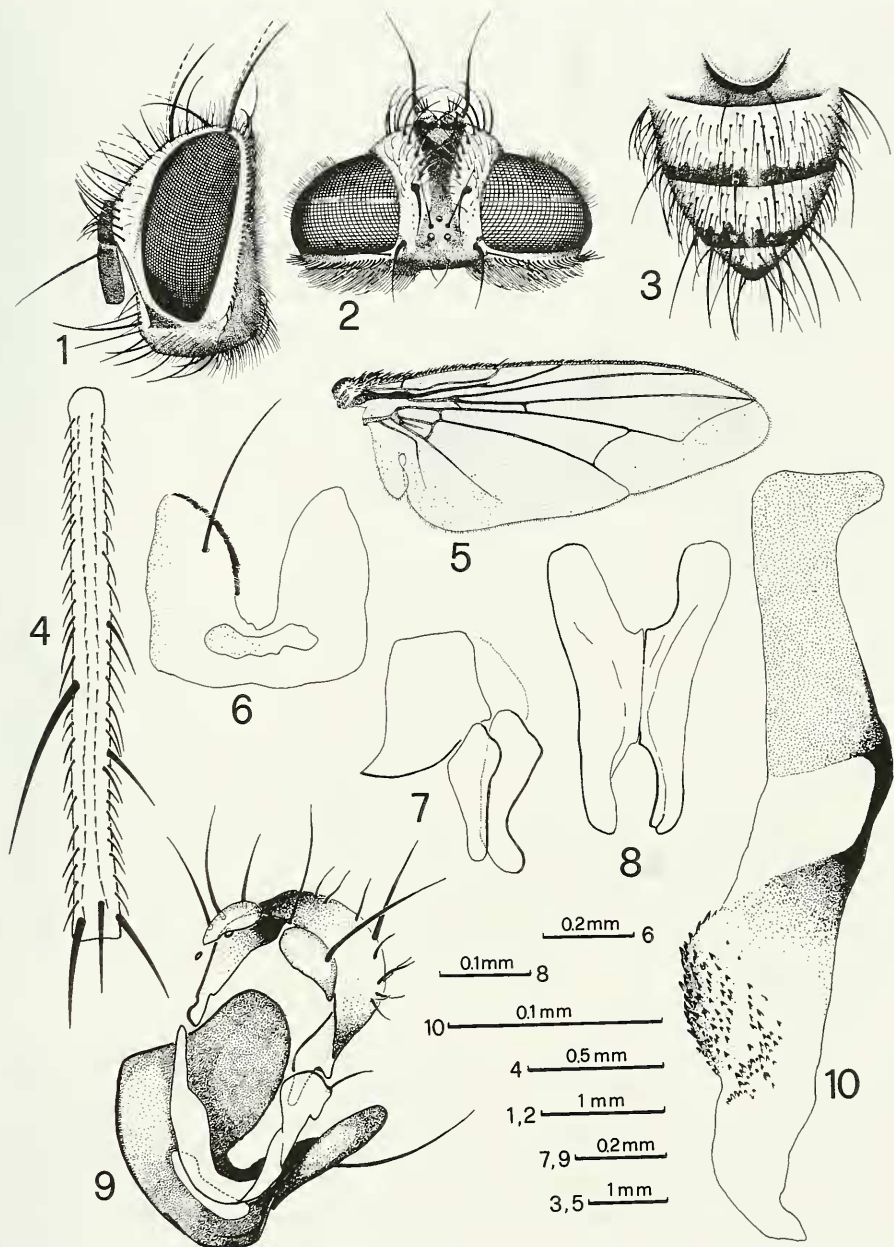


PLATE 3

Figs 1-10. *Nealsomyia rufella* (male) – 1. Head in lateral view (Japan). 2. Head in dorsal view (Japan). 3. Abdomen in dorsal view (Japan). 4. Left mid tibia (Japan). 5. Right wing (Japan). 6. Sternite 5 in ventral view (Thailand, Bangkok). 7. Epandrial complex in left lateral view (Japan). 8. Syncercus in posterior view (Thailand, Bangkok). 9. Segments 6-8 and sternite 5 in anterolateral left view (Japan). 10. Aedeagus in left lateral view (Japan).

vertical] // *Exorista / 4-maculata* / Baranoff. // Det. Baranoff // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. [BMNH]. [1 ♂]: 3172 // FED. MALAY STATES. / Kuala Lumpur. / 3.IV.1926 / ex Psychidae / on *Poinciana regia*. / G.H. Corbett. // Pres. by / Imp. Inst. Ent. / B. M. 1952-299. // *Alsomyia indica* Vill. / L. Mesnil det., 1951 [BMNH]. [1 ♂]: Malaya / Kuala Lumpur / bread from larvae / march 1939 / H.M. Pendlebury / F. M. S. / Museum [underside] // Ex F.M.S. / Museum / B.M.1955-354 [BMNH]. [1 ♀]: Kuala Lumpur 119 / ex *Chalcoscelis fumifera* Swinh [MSNM]. [2 ♀]: Malaya / Kuala Lipis / 1.5. 1931 / G.H. Corbett. / 7635 [left, vertical] // Host 7634 / Psychidae / ? *Clania / variegata* // Pres. by / Imp. Bur. Ent. / Brit. Mus. / 1933-43 // *Exorista / 4-maculata* / Baranoff. [BMNH]. [1 ♀]: Malay Peninsula / 29.3.32 / Pahang. / G.H. Corbett. / 8414 [left, vertical] // Host 8410. Psychidae / on *Palaquium gutta* // *Exorista / 4-maculata* / Baranoff. // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. [BMNH]. [1 ♂]: Malay Peninsula / 9.3.32 / Pahang. / G.H. Corbett. // 8386 [left, vertical] // *Exorista / 4-maculata* / Bar. // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. // Host 9346 / Lepidoptera // on *Palaquium gutta* [BMNH]. [1 ♂]: Malay Peninsula / 9.3.32 / Pahang. / G.H. Corbett. / 8386 [left, vertical] // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. // on *Palaquium gutta* // Host 8346 / Psychidae // *Exorista / 4-maculata* / Baranoff. [BMNH]. [1 ♀]: Malay Peninsula / 23. 4. 32 / Pahang / G.H. Corbett. / 8521 [left, vertical] // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. // Host 9514 lept. on / *Albiryria stipulata* // *Exorista / 4-maculata* / Baranoff. [BMNH]. [1 ♂]: Malay Peninsula / 26.2.32 / Pahang. / G.H. Corbett. // 8337 [left, vertical] // Host 8194 Lepidoptera / on *Palaquium gutta* // *Exorista / 4-maculata* / Bar // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. [BMNH]. [1 ♂]: Malaya / 8215 Pahang / Host - Moth 8159 / 11. 12. 1931 // *Exorista / 4-maculata* / Bar // Pres. by / Imp. Inst. Ent. / B. M. 1933-328. [BMNH].

SRI LANKA. [1 ♂]: Paralectotype // Ceylon / Ratnapura / 27.VI.1922 / ex Psychid / per J.C. Hutson. // *Exorista / 4-maculata* / n.sp. / N. Baranoff [BMNH].

THAILAND. [1 ♀]: Siam / Bangkok Noi / Fruit farm n. R.S. Ladau / ex bagworm on / *Pithecolobium dulce*, Benth // *Exorista / 4-maculata* / Bar // No-10 / 23-10-27 // Pres. by / Imp. Inst. Ent. / B. M. 1933-340 [BMNH]. [1 ♂]: Siam / Bangkok Noi / Fruit farm n. R.S. Ladau / ex bagworm on / *Pithecolobium dulce*, Benth // *Exorista / 4-maculata* / Bar // No-10 / 19-10-27 // Pres. by / Imp. Inst. Ent. / B. M. 1933-340. [BMNH]. [1 ♂]: Siam. / Bangkok. / 18. X. 1929. / W.R.S. Ladell. // *Exorista / 4-maculata* / Bar // Pres. by / Imp. Inst. Ent. / B. M. 1933-340. [BMNH]. [1 ♂]: REARED / NO. BC675 / [handwritten, not translated -?in Thai] // SIAM [left, vertical] // REFERENCE / B.I. 675 / No. 208 / SIAM [left, vertical] // IMP. INST. ENT. / COLL. No. 10660 // *Alsomyia indica* Vill. / L. Mesnil det., 1950 [BMNH]. [1 ♀]: REARED / NO. BC385 / [not translated -?in Thai] // SIAM [left, vertical] // REFERENCE / B.I. 385 / No. 199 / SIAM [left, vertical] // IMP. INST. ENT. / COLL. No. 10660 // *Alsomyia indica* Vill. / L. Mesnil det., 1950 [BMNH]. [1 ♀]: REARED / NO. BC675 / [handwritten not translated -?in Thai] // SIAM [left, vertical] // REFERENCE / B.I. 675 / No. 268 // SIAM [left, vertical] // IMP. INST. ENT. / COLL. No. 10660 // *Alsomyia indica* Vill. / L. Mesnil det., 1950 [BMNH].

Redescription. MALE. Length. 3.7-6.7 mm

Colour. Head black – except frontal vitta and gena - with light grey microtrichosity; frontal vitta reddish-brown or dark brown; gena black, reddish or yellowish. Antennal scape and pedicel brown, reddish or yellowish; postpedicel basally yellow or reddish shading into black or brown distally, rarely entirely black. Palpus yellow. Thorax (except scutellum) black in ground colour, with grey microtrichosity; scutum, before transverse suture, with four longitudinal dark vittae; posterior 1/3-1/2 of the scutellum reddish or yellowish or scutellum entirely black. Abdomen black in ground colour, sides of tergites 2, 3 and anterior half of 4 reddish or yellowish (rarely only on sides of tergite 2); abdominal tergites 3 and 4 dorsally microtrichose on anterior 4/5-1/1, tergite 5 with microtrichosity on its anterior 2/3-4/5. Tegula black or brown, basica costa yellow or brown, rarely black, costa basally yellowish shading into brown distally, remaining veins brown. Halteres yellow. Legs: coxa and trochanter black or

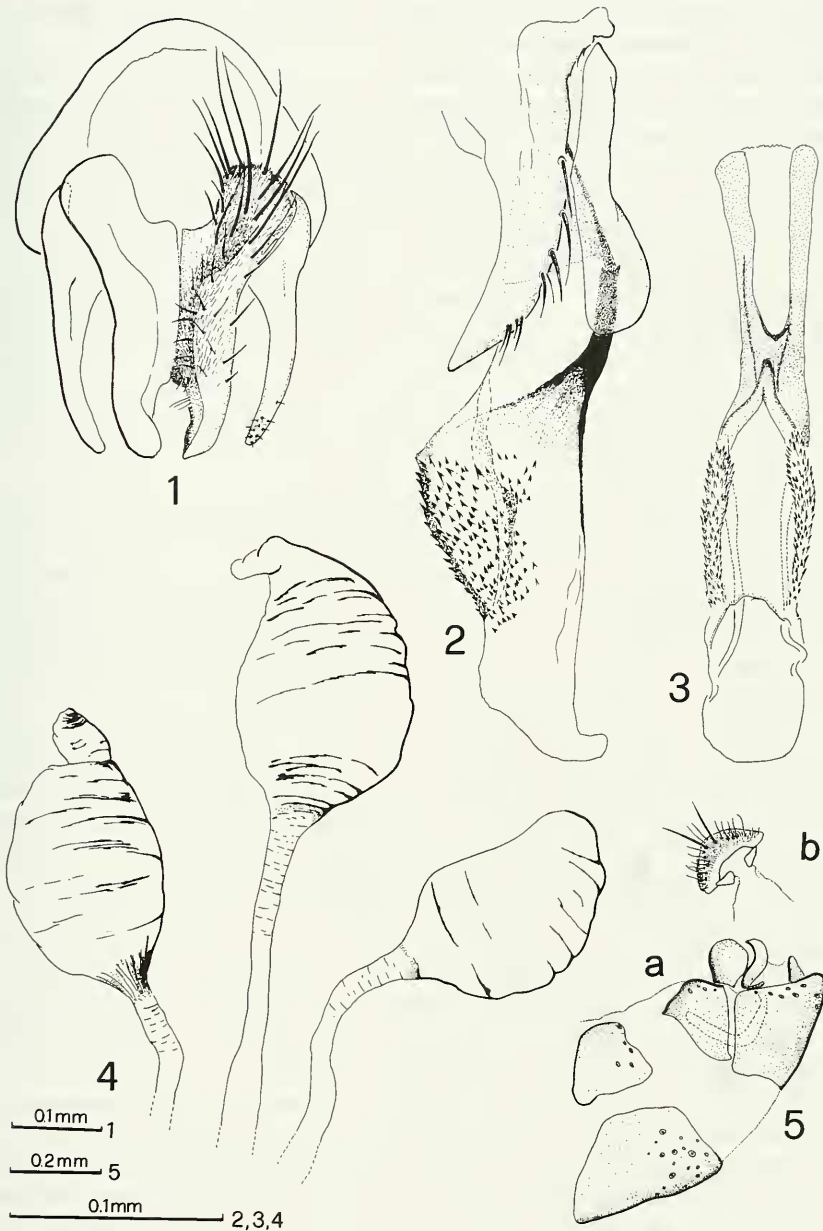


PLATE 4

Figs 1-3. *Nealsomyia rufipes*: S India (male) - 1. Epandrial complex in posterior view. 2. Aedeagus, pregonite and postgonite in left lateral view. 3. Aedeagus in ventral view. Figs 4-5a,b. *Nealsomyia rufella*: Japan (female) - 4. Spermathecae. 5a. Postabdomen in left lateral view. 5b. Postgenital plate in ventral view.

reddish-brown, femora black or brown, tibia black or brown, tarsi black. Fore femur microtrichose on its posterior surface.

Head (Figs 3.1, 3.2). Arista thickened on its basal 2/5-1/2. Second aristomere not longer than wide. Postpedicel 1.7-2 times as long as pedicel. Eye densely covered with long hairs that are longer than combined diameter of four facets. Frons at its narrowest point 0.6-0.8 times as wide as an eye in dorsal view. Medial vertical seta strong, reclinate and sub-parallel, about 1/2 as long as vertical eye diameter. Lateral vertical seta very weak, slightly differentiated from the postocular setae. One upper reclinate orbital setae about as long as medial verticals (if two, the posterior one short and weak). Nine to 10 frontal setae descending to the level of the base of the arista. Fronto-orbital plate with one or two rows of sparse, proclinate black setulae lateral to the row of frontal setae. Parafacial (in lateral view) at its narrowest point 0.3-0.7 (0.2 in one specimen from Laos) times as wide as the width of postpedicel. Gena in profile about 1/6-1/5 of vertical eye height. Postocular setae long, bent forwards. Prementum about 3 times as long as wide. Palpus cylindrical or slightly clavate, with some setulae ventrally and apically.

Thorax. Prosternum with some setulae on its lateral margin. Scutum with 3+3 acrostichal setae, 3+4 dorsocentral, 1+3 intraalar, 2 posthumeral, 1 presutural, 2 notopleural, 3 supraalar; postalar callus with 3 setae. Proepimeron with 1-4 strong setae and several long setulae. Katepisternum with 3 setae. One anepimeral seta. Anepisternum with 5-7 setae. Katepimeron bare. Scutellum with 1 pair of discal setae, 1 pair of crossed (horizontal or inclined at most 30° to horizontal) apical setae, 1 subapical, 1 lateral, 1 basal; (lateral setae about 4/5 as long as basal setae).

Legs. **Fore leg** – Tibia with 4-7 anterodorsal setae, 1-2 posterodorsal, 2 posterior setae; anterodorsal preapical seta shorter than dorsal. Claws longer than tarsomere 5. **Mid leg** – Femur with rows of very irregular, in number, length and thickness, anteroventral and posteroventral setae, 0-2 anterior setae and 2-4 posterior setae. Tibia (Fig. 1.4) with 1 anterodorsal seta; 1-2 weak posterodorsal, 2 posterior, 1 ventral. Claws about as long as tarsomere 5. **Hind leg** – Tibia with an irregular row of anterodorsal and posterodorsal setae, each row with 1-2 setae about 1.5 times as long as the others; 2-3 anteroventral setae, 2 dorsal preapical setae. Posteroventral preapical seta shorter than anteroventral preapical. Claws about 0.9 times as long as tarsomere 5.

Wing (Fig. 1.5). Costal spine about as long as crossvein R-M or slightly longer. Second costal portion ventrally bare. Base of R₄₊₅ with 3-6 setulae. Cell r₄₊₅ closed just at wing margin.

Abdomen (Fig. 1.3). Syntergite 1+2 with 1 pair of median marginal setae, 1-3 pairs of lateral marginal setae longer than median marginals; general setulae long and robust (longer on the sides of the syntergite). Tergite 3 with 1 pair of median marginal setae about 0.7-1.0 times as long as the dorsal length of tergite 3; 1 or 2 pairs of lateral marginal setae. Tergite 4 with a row of 11 marginal setae. Tergite 5 with rows of marginal and discal setae.

Terminalia. Cerci narrow, with a dorso-medial suture, apically separated from each other and slightly bent medially. Surstylus (Figs 3.7, 4.1) narrow, well developed, sub-triangular in lateral view, with several setulae latero-apically. Pregonite (as in Fig. 4.2) bent anteriorly, with a row of short and stout setae on its dorsal margin. Postgonite (as in Fig. 4.2) slender, rounded apically and bare.

FEMALE. Differs from male as follows: *Head*. Two proclinate orbital setae. Frons at its narrowest point 0.8-1.0 times as wide as an eye in dorsal view. *Abdomen*. Tergites 3 and 4 without patches of appressed setulae. *Postabdomen and genitalia* (Figs 4.4, 4.5a,b). Segments 6 and 7 retracted into the segment 5. Tergite 6 and 7 interrupted medio-dorsally forming two sub-trapezoidal sclerites bearing setae. Sternites 6 and 7 wider than corresponding tergites. Tergite 8 divided into two curved sclerites. Sternite 8 short and robust, sub-triangular in ventral view. Postgenital plate slightly bent upwards in lateral view, bearing setulae and microtrichia ventrally. Cerci sub-circular in lateral view. Three sub-globular well sclerotized spermathecae.

PUPARIUM. Sub-elliptical. Surface smooth except for transverse band of spinules on each segment. Posterior spiracle borne on short and heavily sclerotized tubercle; each spiracle with 3 openings. Spiracles divided by a broad sub-triangular or T-shaped carina.

Hosts and biological notes. *Nealsomyia rufella* has been reared from the larvae of the following species: *Amicta quadrangularis* Christoph, 1873 (Lepidoptera, Psychidae) – a species known from Armenia, Iran, Iraq and near East to Egypt. The status and distribution are, however, not yet clear. The species is also reported from Algeria, but this may be another species or a misidentification (Hättenschwiler, 2004 pers. comm.). – *Chalcozelis albigitatus* (Snellen, 1879) (Lepidoptera, Limacodidae) – a polyphagous, widespread Oriental species, recorded on *Aleurites triloba* Forster (Euphorbiaceae), *Camellia* (Ternstroemiaceae), *Durio* (Malvaceae), *Elaeis* (Arecaceae), *Eugenia malaccensis* Linnaeus (Myrtaceae), *Nephelium* (Sapindaceae), and recorded as an important pest of *Cocos nucifera* Linnaeus (Arecaceae) in Malaysia and Indonesia (cf. Ooi *et al.* 2002). – *Eumeta variegata* (Snellen, 1879) (Lepidoptera, Psychidae) – a widespread species in India and Nepal, reaching the Solomon Islands; it is recorded from nearly all areas of Southeast Asia (Hättenschwiler, 2003 pers. comm.). – *N. rufella* has also been recorded from other unidentified psychids collected from tree species, some of which are of economic interest, such as: 1) *Albizia chinensis* Merrill (= *A. stipulata* Boivin) (Fabaceae), species widespread from the Tropical Hymalayas in Kumaon and Sikkim, to Sri Lanka, Birma and the Malaya Isles (Baker, 1878), 2) *Areca* spp. (Arecaceae), 3) *Cinnamomum cassia* Blume (Lauraceae), an Oriental species widespread in Southern China, Burma, Laos and Vietnam (commercial cultivation is restricted to China and Vietnam) – in Chinese cookery, cassia is an essential ingredient–, 4) *Delonix regia* (Bojer ex Hook.) Raf. (= *Poinciana regia*) (Cesalpinaceae), species originally from Madagascar, which is now widespread as an ornament in many subtropical and tropical areas of Asia and America, 5) *Palaquium gutta* Burk (Sapotaceae), an Oriental species from which gutta-percha is obtained, 6) *Pithecolobium dulce* Benth. in Hook (Fabaceae), a species cultivated throughout India, but of South American origin (Baker, 1878). *Nealsomyia rufella* in Japan, where it was probably accidentally introduced (Shima, 1999), is a parasite of *Eumeta japonica* (Heylaerts, 1884) (most likely a synonym of *E. variegata*), a species known only from Japan (Hättenschwiler, 2004 pers. comm.). It is a common pest of many artificially - grown tree species, like those of roadsides and cities, but has never been found in natural forests (Shima & Tachi, 1996); the same authors recorded high percentages of parasitization (approximately 90%) in Fukuoka, indicating *N. rufella* as a gregarious parasite.

Distribution (Map 1). Palaearctic: Iran, Japan (S Honshu, Kyushu); Oriental: China (Canton; Shandong Province), Indonesia (Sumatra), Laos, Malaysia (Malaya), Sri Lanka, Thailand, Vietnam.

Nealsomyia rufipes (Villeneuve, 1937)

Alsomyia rufipes Villeneuve, 1937: 407 [original description] (type locality – India, Coimbatore); Crosskey, 1976: 264 [lectotype designation].

Nealsomyia rufipes (Villeneuve, 1937): Mesnil, 1954: 356, 358 [redescription]; Crosskey, 1976: 251 [catalogue]; Crosskey, 1981: 692 [catalogue]; Harris, 1989: 192 [biology].

Material examined. INDIA. [Punjab] - [1 ♂, 1 ♀]: *Exorista* / 4-maculata / Baran. // *Pinus* / longifolia // Pres. by / Imp. Inst. Ent. / B. M. 1935-233. // Chakmoh / Hoshiarpur, Punjab / B. M. Bhatia. / 7. IV. 1931 [BMNH]. [Bihar] - [2 ♀ ♀]: INDIA / [Ranchi] Namkum / 7.9.1965 / B. N. sah Coll. [BMNH]. [Gujarat] - [1 ♂]: V. C. PATEL / INST OF AGRI. / [Ahmadabad] ANAND (G.S.) // 23. Ex: Larvae Host: *P. granatum* / var. *nana* / June. '65 // C. I. E. COLL. / A. 1940 // *Nealsomyia* / rufipes Vill. / R. W. Crosskey det. 1966 [BMNH]. [Karnataka] - [1 ♂]: Ex Psychid / on terminalia // Pugalur, Sept. 1973 // CIBC – 1.5 / Bangalore // 1 // *Nealsomyia rufipes* Villeneuve / L.P. Mesnil det., 1985 // EX / L.-P. MESNIL / COLLECTION 1985 [CNC]. [1 ♀]: Bangalore. Ind. / 16-9-'57 // ex bagworm on leaves of Ciuava // 3 // CIBC -BSC.I.E. COLL / No. 17639 // *Nealsomyia rufipes* Vill. [BMNH]. [1 ♂]: Bangalore. Ind./ 16-9-'57 // ex bagworm on leaves of Ciuava // 1 // CIBC- BS. // C.I.E. COLL / No. 17639 [BMNH]. [Tamil Nadu] - [1 ♂, 1 ♀]: *Exorista* / 4-maculata / Baran. // Pres. by / Imp. Inst. Ent. / B. M. 1936-522. // S. INDIA / COIMBATORE / par on Psychid / KPA COLL 27 I 32 [BMNH]. [1 ♂]: 14. VIII. 15 / SOUTH INDIA / COIMBATORE / Par on *Clania* / *cramerii* / M.O.P. Coll. [BMNH].

PAKISTAN. [1 ♂]: Rawalpindi Pak. / 25. 9. 56 // Ex. Case bearing / larvae // C.I.B.C. 197 / 56-1 // Pres by / Com Inst Ent / B.M. 1959-378 // C.I.E. COLL / No. 15603 [BMNH]. [1 ♀]: Rawalpindi. Pak. / 27. 9. 56 // Ex. Case bearing / larvae // C.I.B.C. 197 / 56-1 // Pres by / Com Inst Ent / B.M. 1959-378 // C.I.E. COLL / No. 15603 [BMNH].

SRI LANKA. [1 ♀]: 157 // Ceylon / Trincomali / 18. XI. 90 / It. Coll. Yerbury. / 1892-192. [BMNH].

Redescription. Male and female differ from those of *N. rufella*, only in the colour of the integument, as follows:

Legs yellow or red. Posterior half of the scutellum yellowish or red, sometimes completely yellowish; sides of tergites 3 and 4 usually largely yellow or red, sometimes abdomen almost entirely yellow except for a dark median longitudinal vitta on tergites 3, 4 and 5.

For other features, such as morphometric ratios, chetotaxy and the anatomy and morphology of the male and female terminalia, the specimens of *N. rufipes* are close to the range of variability of *N. rufella*. Nevertheless, I have chosen to retain *N. rufipes* as a valid species for the moment due to the stability of colour and the absence, among the examined material, of specimens with intermediate colour patterns.

Nealsomyia rufipes and *N. rufella* are easily distinguishable from the other known species of *Nealsomyia* in possessing 4 postsutural dorsocentral setae, one anterodorsal seta on the mid tibia, and lacking median discal setae on abdominal tergites 3 and 4.

Hosts. *Nealsomyia rufipes* is a parasite of *Eumeta crameri* (Westwood, 1854) (Lepidoptera, Psychidae), recorded from Pakistan, India, Nepal and Sri Lanka (Hättenschwiler, 2003 pers. comm.), and of other non-identified species of psychids (cf. Crosskey, 1976).

Distribution (Map 1). Oriental: Pakistan, India (Bihar, Gujarat, Karnataka, Madras, Mysore, Punjab, Tamil Nadu), Sri Lanka.

Nealsomyia triseriella (Villeneuve, 1929)

Pls 5, 6

Exorista (*Alsomyia*) *triseriella* Villeneuve, 1929: 185 [original description] (type locality – Egypt, Sahara esh-Sharqiya, nr. Helwan (= Heluan, = Helouan), Wadi-Hof).

Nealsomyia triseriella: Mesnil, 1939: 31 [description]; Mesnil, 1954: 359 [redescription]; Kugler, 1979 [faunistic data]; Herting, 1984:64 [catalogue]; Herting & Dely-Drascovits, 1993: 227 [catalogue].

Material examined. [EGYPT]. [Holotype ♂]: WADI-HOFF [= Wadi-Hof, = Wadi Hawf] / 21.3.22 // *Alsomyia triseriella* / n. sp. [handwritten] // *Nealsomyia triseriella* Vill. L. P. Mesnil det., 1969 [name of the species handwritten] // TYPE [red paper] // ex / L.-P. MESNIL / COLLECTION 1970 [CNC]. [2 ♂♂]: Sinai mts. / Wadi Tlach / 1500 m 15.VII.74 / F. Kaplan [TAU].

Redescription. MALE. Length: 6.7-7.0 mm.

Colour. Head black - except frontal vitta and gena - with light grey microtrichosity; frontal vitta reddish-brown or dark brown; gena reddish. Antenna black. Palpus yellow. Thorax (except scutellum) black in ground colour, with grey microtrichosity; scutum, before transverse suture, with four longitudinal dark vittae; posterior 1/3 of the scutellum reddish. Abdomen black in ground colour, sides of tergites 2, 3 and (holotype) anterior half of 4, reddish; abdominal tergites 3 and 4 dorsally microtrichose on anterior 4/5-5/6, tergite 5 with microtrichosity on its anterior 2/3-4/5. Tegula and basicosta black or dark brown, costa basally yellowish, shading into brown distally, remaining veins brown. Halter yellow. Legs: femora black, tibia black or brown, tarsi black. Fore femur microtrichose on its posterior surface.

Head (Figs 5.1, 5.2). Arista thickened on its basal 2/5. Second aristomere not longer than wide. Postpedicel 1.7-2.2 times as long as pedicel. Eye densely covered with long hairs that are longer than combined diameter of four facets. Frons at its narrowest point 0.8-0.9 times as wide as an eye in dorsal view. Medial vertical setae strong, reclinate and sub-parallel, about 2/3 as long as vertical eye diameter. Lateral vertical seta very weak, not differentiated from the postocular setae. One reclinate orbital seta about as long as medial vertical one. Nine to 10 frontal setae descending to the level of the base of the postpedicel. Fronto-orbital plate with one or two rows of sparse black setulae lateral to the row of frontal setae. Parafacial (in lateral view) at its narrowest point 0.7-0.9 times as wide as the width of postpedicel. Gena in profile about 1/3 of vertical eye height. Postocular setae long, bent forward. Prementum about 4 times as long as wide. Palpus cylindrical with some setulae ventrally and apically.

Thorax. Prosternum with a few setulae (1-2) on its lateral margin or bare. Scutum with 3+3 acrostichal setae, 3+3 dorsocentral, 1+3 intraalar, 2 posthumeral, 1 presutural, 2 notopleural, 3 supraalar; postalar callus with 3 setae. Proepimeron with 3 strong setae and 8-10 long setulae. Katepisternum with 2 or 3 setae. One anepimeral seta. Anepisternum with 6-7 setae. Katepimeron with few setulae on anterior 1/5. Scutellum (Fig. 5.3) with 1 pair of discal setae, 1 pair of crossed (horizontal or inclined at most 30° to horizontal) apical setae, 1 subapical, 1 lateral (holotype with two lateral on one side and one on the other side), 1 basal; lateral setae about 4/5 as long as basal setae.

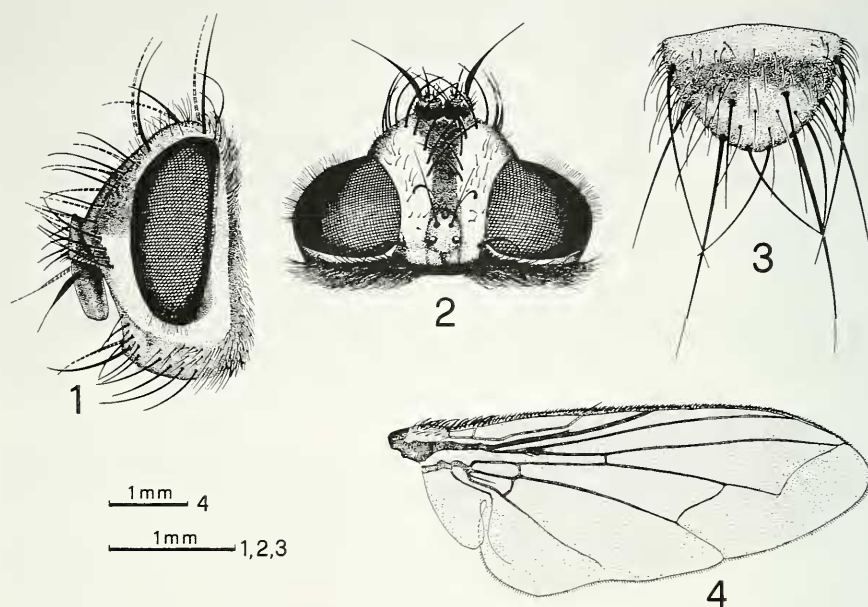


PLATE 5

Figs 1-4. *Nealsomyia triseriella*: Egypt (male) - 1. Head in lateral view (Wadi-Hof - holotype). 2. Head in dorsal view (Wadi-Hof - holotype). 3. Scutellum in dorsal view (Wadi-Hof - holotype). 4. Right wing (Sinai).

Legs. **Fore leg** - Tibia with 4 (rarely 5) anterodorsal setae, 2 posterodorsal, 2 posterior setae, anterodorsal preapical seta shorter than dorsal seta. Claws longer than tarsomere 5. **Mid leg** - Femur with rows of very irregular, in number, length and thickness, anteroventral and posteroventral setae, 0 (holotype)-2 anterior setae and 2 posterior setae. Tibia (as in Fig. 2.4) with 2 anterodorsal setae, the upper anterodorsal seta very short and weak, less than $1/3$ as long as the middle anterodorsal one - rarely one very weak seta below middle and/or between middle and upper one; 1-2 weak posterodorsal, 2 posterior, 1 ventral. Claws about as long as tarsomere 5. **Hind leg** - Tibia with an irregular row of anterodorsal and posterodorsal setae, each row with a seta almost at midlength, about 1.5 as long as the others; 2 anteroventral setae, 2 dorsal preapical setae. Posteroventral preapical seta shorter than anteroventral preapical. Claws about 0.90 times as long as tarsomere 5.

Wing (Fig. 5.4). Costal spine about as long as crossvein R-M or slightly longer. Second costal portion bare ventrally. Base of R_{4+5} with 3-5 setulae. Bend of M with a short stub only in the holotype; stub lacking in the other specimens. Bend of M nearly at a right angle or slightly obtuse. Wing cell r_{4+5} with a short petiole, at least as long as the diameter of veins M, at most as long as $1/10$ of the section of M beyond bend.

Abdomen. Syntergite 1+2 with 1 pair of long median marginal setae, 2-3 pairs of lateral marginal setae; general setulae long and robust (longer on the sides of the syntergite). Tergite 3 with 1 pair of median marginal setae about 1.25 times as long as the dorsal length of the tergite 3; 1 pair of median discal setae (sometimes 1-4 addi-

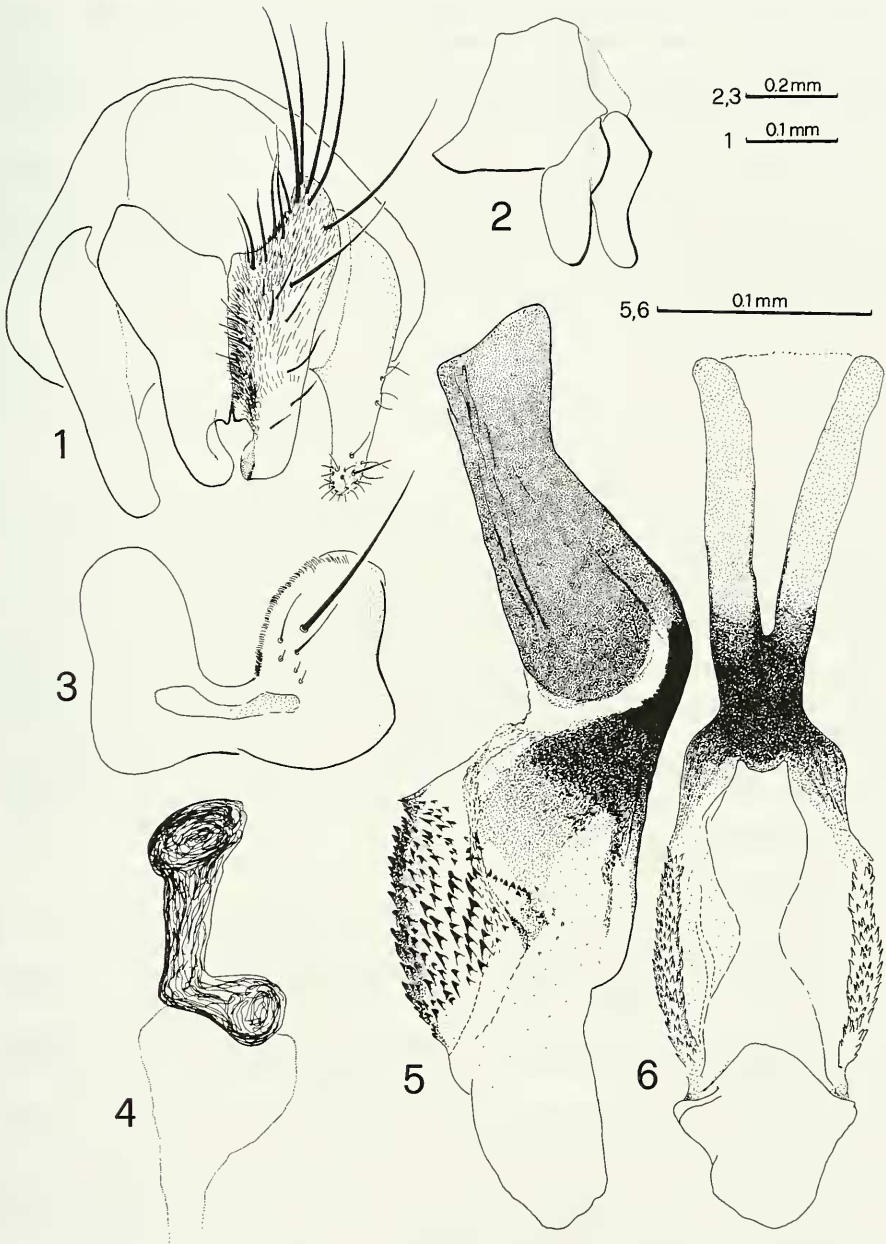


PLATE 6

Figs 1-6. *Nealsomyia triseriella*: Egypt, Sinai (male) – 1. Epandrial complex in posterior view. 2. Epandrial complex in left lateral view. 3. Sternite 5 in ventral view. 4. Ejaculatory apodem in left lateral view. 5. Aedeagus in left lateral view. 6. Aedeagus in ventral view.

tional irregular setae are present) about 0.60-0.70 times as long as median marginal and sub-equal to the median marginals of syntergite 1+2; 1 or 2 pairs of lateral marginal setae. Tergite 4 with a row of 17-20 marginal setae, 1-2 pairs of median discal setae and some long and robust setulae medially. Tergite 5 with rows of marginal and discal setae.

Terminalia. Cerci (Figs 6.1, 6.2) broad, with a dorso-medial suture, apically separated from each other and slightly bent medially. Surstylus (Figs 6.1, 6.2) well developed, sub-elliptical in lateral view, with several setulae latero-apically. Pregonite apically rounded and bent anteriorly, with a row of short and stout setae on its dorsal margin. Postgonite slender, rounded apically and bare.

FEMALE. Unknown.

Hosts. Unknown.

Distribution (Map 1). Palearctic: Egypt (Sahara esh-Sharqiya; Sinai).

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